

REMARKS

With the entry of the foregoing amendments, claims 1, 3-13, 24-26, and 29-63 are pending. Claims 2, 14-23 and 27-28 have been cancelled without prejudice.

For the Examiner's convenience, the claim groupings are explained in more detail below.

At the outset, applicants note with appreciation the indication of allowable subject matter in original claims 7, 12-13, 20, 22-23, and 25-28.

In line with the indication of allowable subject matter in claim 7, applicants have prepared a new set of claims, i.e., claims 41-51. Claim 41 contains the allowable subject matter of claim 7 and its intervening claims 1-5. The new claims 42-51 that depend from claim 41 are copies of original claims 6, 8-13 and 24-26. Thus, no new matter has been added by way of new claims 41-51. All of these claims contain the allowable subject matter of claim 7 and its intervening claims.

Also in line with the indication of allowable subject matter in claim 20, applicants have prepared a new set of claims, i.e., claims 52-63. More specifically, claim 52 contains the allowable subject matter of claim 20 and its intervening claims 1 and 14. The new claims 53-63 that depend from claim 52 are copies of original claims 15-24 and 27-28. Thus, no new matter has been added by way of new claims 52-63. All of these claims contain the allowable subject matter of claim 20 and its intervening claims.

To further distinguish the other pending claims from the cited Nepela reference, claim 1 has been amended to incorporate the subject matter of claim 2 and the subject matter from page 5 of the specification regarding the fact that "said compressible layer

is obtained by and comprises a polymer, elastomer or gel, which is compressible by applying a pressure and which behaves in resilient fashion” – unlike anything disclosed or suggested in Nepela.

To also further distinguish the cited Nepela reference, new independent claim 29 and its dependent claims have been added. New claim 29 is a combination of original claims 1, 14 and 16, and includes, among other distinguishing features, the fact that the claimed invention requires “wherein said magnetic layer (122) configured to determine a variable magnetisation (MF) in response to the variation in temperature (T) is a layer with low Curie temperature (Tc)” – unlike anything disclosed or suggested in Nepela. New claims 30-40 that depend from claim 29 are the original claims 15, 17-24 and 27-28. Thus, no new matter has been added.

In line with the Examiner’s request, attached is a replacement Abstract, which renders moot the abstract objection.

Turning to the prior art rejections, claims 1-6, 8-10 and 24 were rejected as allegedly being anticipated by Nepela. Claims 11, 14-19 and 21 were rejected as allegedly obvious over Nepela. For at least the following reasons, applicants traverse the rejections and, in any event, submit that the claim amendments render the rejections moot.

First, pending claims 41-63 are in allowable condition because they simply relate to placement of the allowed dependent claims in independent form.

Second, as explained in more detail below, the remainder of the pending claims (1, 3-13, 24-26, and 29-40) are allowable because Nepela does not disclose or suggest,

among other things, at least one of the following elements that are contained in these claims:

- (a) (claims 1, 3-13, 24-26) wherein said physical quantity (P, T) is a pressure (P) and wherein said compressible layer is obtained by and comprises a polymer, elastomer or gel, which is compressible by applying a pressure and which behaves in resilient fashion, or
- (b) (claims 29-40) wherein said physical quantity (P, T) is a temperature (T), and wherein said magnetic layer configured to determine a variable magnetisation (MF) in response to the variation in temperature (T) is a layer with low Curie temperature (Tc).

The following information puts Nepela's disclosures and teachings in the proper context so that some of the distinctions with the claimed invention can be properly appreciated.

Nepela discloses a magnetic sensor in the form of a spin valve. Nepela's Figure 3 shows a conventional spin valve structure, including antiferromagnetic/magnetic multilayers called "keeper" layers. These keeper layers have the effect of determining, in the free layer of the spin valve, a magnetization in a direction opposite to that of the pinned layer. Thus, the resulting magnetization in the free layer is zero. Accordingly, longitudinal ferromagnetic structures are provided for the purpose of reducing the Barkhausen noise.

Significantly, Nepela does not disclose either that the quantity controlling the sensor can be a pressure, or that such quantity can be a temperature. Among other distinctions, these are critical distinctions compared to the claimed invention.

For what concerns the “pressure” issue in the claimed invention (e.g., claims 1, 3-13, 24-26) and as addressed in the Office Action, the Examiner states at the beginning of page 3 that the physical quantity can be any stress causing effect such as a pressure or force. Respectfully stated, this assertion by the Examiner is not correct. In the first place, it is not possible to find in the Nepela reference any disclosure mentioning application of a stress or of a pressure to the layers for any purpose, nor that the Nepela spin valve can be subjected to a stress or pressure without breaking, or malfunctioning, or losing the properties of zero magnetization in the free layer – which are sought by Nepela.

It is also important to note that “compressibility” as known in the art is the ability of undergoing volume change. The Mn alloy used by Nepela, even if it arguably shows a very weak degree of compressibility, is not compressible within the meaning of the claimed invention, i.e., compressible exactly in the same way as the NiMn alloy described in the applicant’s specification.

In summary, and respectfully stated, the very short claim 2 argument in the Office Action is unfounded and also affected by a considerable amount of improper hindsight. Nevertheless, in order to avoid further debate and in an effort to advance prosecution, claim 1 has been amended to add the subject matter of claim 2 and to specify that the compressible layer is obtained by and comprises a polymer, elastomer or gel, which is

compressible by applying a pressure and which behaves in resilient fashion. As a result, claims 1, 3-13 and 24-26 are not anticipated or rendered obvious by Nepela.

For what concerns the “temperature” issue in the claimed invention (e.g., claims 29-40) and as addressed in the Office Action, the rejection does not take into account the full and proper context of the Nepela reference. Respectfully stated, the rejection attempts an improper ex-post reconstruction of Nepela based loosely on the concept that since a spin valve shows resistance changes, then a temperature variation could also influence the resistance change. As mentioned above, the device disclosed in Nepela is designed to operate in an equilibrium condition of the magnetization in the free layer; thus, it is obvious that variations of temperature disturb such equilibrium – which is contrary to the Nepela teachings and objectives. Also, the Nepela reference mentions temperature at column 3, lines 28-38; however, this is just to explain that AFM layers undergo temperature cycles at certain blocking temperatures in order to obtain a certain orientation of their respective magnetizations. This, of course, does not correspond to disclosing control of the resistance through temperature during the operation of the device. Consequently, the Nepela reference does not disclose or suggest that “said magnetic layer configured to determine a variable magnetisation (MF) in response to the variation in temperature (T) is a layer with low Curie temperature (Tc)” – as required in original claim 16 – which is now part of new claims 29-40. Thus, claims 29-40 are not anticipated or rendered obvious by Nepela.

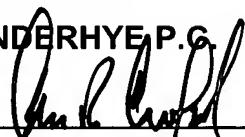
For at least the foregoing reasons, applicants submit that this application is condition for allowance. A notice to that effect is earnestly solicited.

**PULLINI et al
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If the Examiner has any questions, the undersigned can be contacted at 703-816-4009.

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